

**MESSRS.**

---

**SPECIFICATION FOR APPROVAL****承 认 书**

|                   |                         |
|-------------------|-------------------------|
| Product           | WATERPROOF TYPE SPEAKER |
| Part No.          | HDK-150808ZA-4P (RoHS)  |
| Customer Approval |                         |

|                    |                    |                     |
|--------------------|--------------------|---------------------|
| Approved By        | Checked By         | Made By             |
| 王台平<br>SEP-10-2018 | 曹丽萍<br>SEP-10-2018 | LILY<br>SEP-10-2018 |

**常 州 华 龙 电 子 有 限 公 司***Chang zhou Dragon State Electronic Co., Ltd*

中国江苏省常州市新区电子园新四路 36 号

Tel: +86-519-85110078. 86-519-85106698, Fax: +86-519-85101081

EDITION:1.1

**1. Specification**
**HDK-150808ZA-4P (RoHS)**

| ITEM |                            | SPECIFICATIONS  |
|------|----------------------------|---|
| 01   | Type                       | Dynamic speaker   |
| 02   | Dimension                  | External diameter 15*8 mm   |
| 03   | Rated Input Power          | 0.5W In 0.8cc Box   |
| 04   | Max. Input Power           | 0.8W In 0.8cc Box For 1 Minute  |
| 05   | Impedance                  | 8ohm $\pm$ 15% at 2000Hz.   |
| 06   | Resonance Frequency (Fo)   | 600Hz $\pm$ 20% at In 1Free Air   |
|      | Resonance Frequency (Fo)   | 850 Hz $\pm$ 20% at In 0.8cc Box  |
| 07   | Sensitivity (S.P.L.)       | 88.5 $\pm$ 3 dB SPL /2Vrms/0.1M at 2000Hz in 0.8cc box  |
| 08   | Frequency Range            | Fo – 20KHz  |
| 09   | Dustproof and waterproof   | IP68 (1hour 2metres )   |
| 10   | Total Harmonics Distortion | Max 10% at 1 KHz,0.5W.  |
| 11   | Weight                     | 1.5g $\pm$ 5%g  |
| 12   | Appearance                 | Should not exist any obstacle to be harmful to normal operation; damages, cracks, rusts and distortions, etc. |
| 13   | Operation Test             | Must be normal at program source – 0.5W   |
| 14   | Buzz, Rattle, etc.         | Must be normal at sine wave 0.89Vrms (in free air) /2Vrms(in 0.8cc box) from 300~10KHz                        |
| 15   | Polarity                   | When positive voltage is applied to the terminal marked (+), diaphragm should move to the front.              |
| 16   | Terminal Strength          | Capable of withstand 1kg load for 30 seconds without resulting in any damage or rejection.                    |
| 17   | Temperature                | Operating temperature: -30℃ to +70℃<br>Storage temperature: -30℃ to +70℃                                      |

## 2-1. Test Condition

### Standard

Temperature : 15 ~ 35℃

Relative humidity : 25% ~ 85%,

Atmospheric pressure : 860mbar to 1060mbar.

### Basic

Temperature : 20±3℃

Relative humidity : 60% ~ 70%

Atmospheric pressure : 860mbar to 1060mbar

## 2-2. Standard Test Fixture

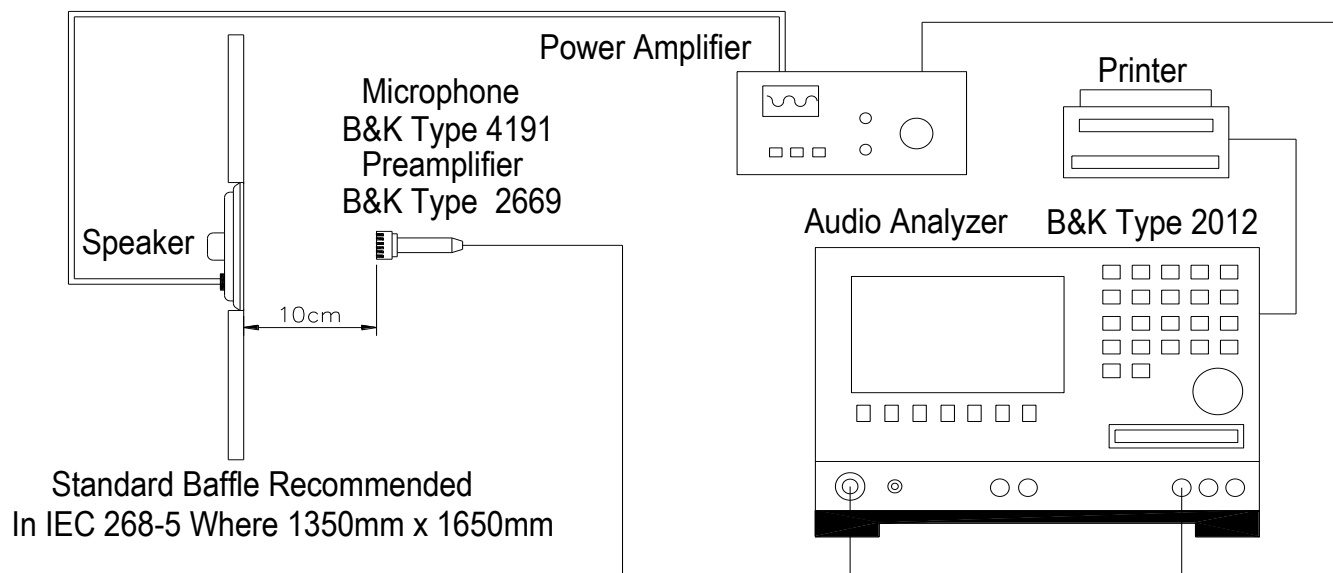
1.Input Power : 0.1W ( 0.89V )

2.Zero Level : -dB

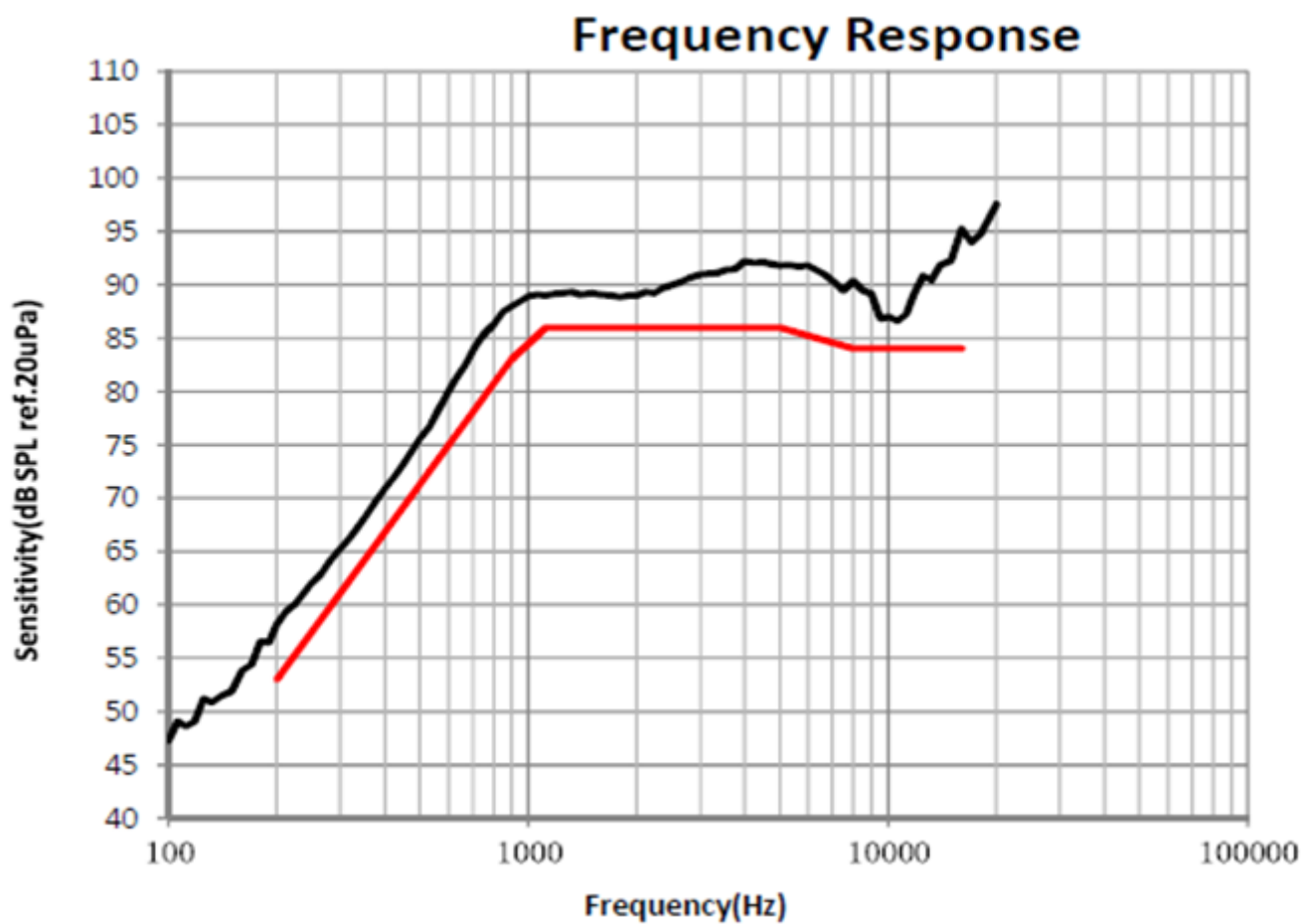
3.Mode : SPEAKER

4.potentiometer Range : 50dB

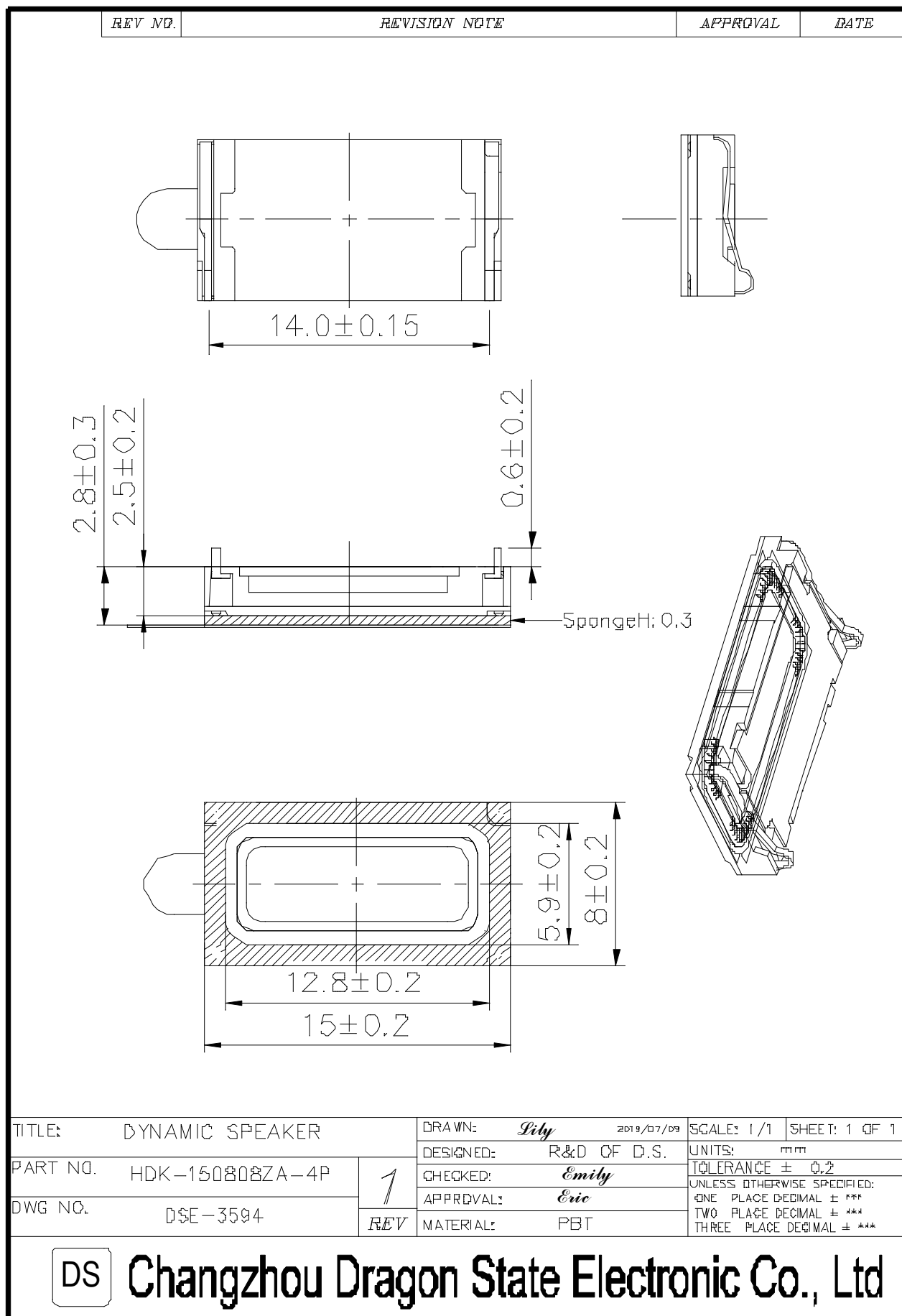
5.Sweep Time : 0.5sec



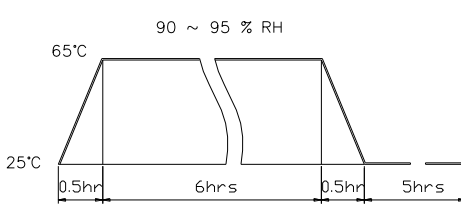
## 2-3. Frequency Response Curve



### 3. Dimension



#### 4. Reliability Test

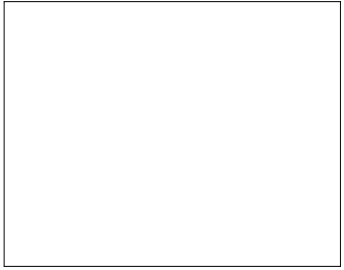
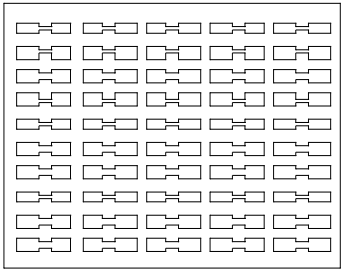
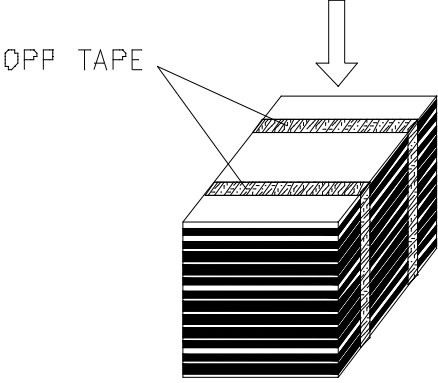
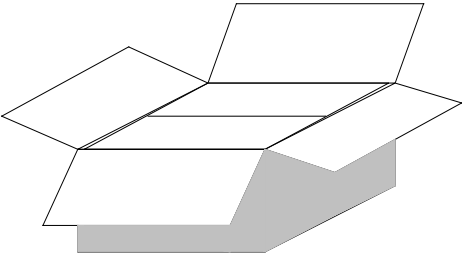
| Items.   |                            | Specifications  |
|--|----------------------------|---|
| 01   | High temp. Test            | Keep 96 hours at $+70^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and leave 3 hours in normal temperature and then check   |
| 02   | Low temp. Test             | Keep 96 hours at $-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and leave 3 hours in normal temperature and then check   |
| 03   | Humidity test              | Keep 96 hours at $+40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ relative humidity 95% and leave 3 hours in normal temperature and then checked.  |
| 04   | Temp./Humidity cycle       | <p>The part shall be subjected 5 cycles. One cycle shall be 12 hours and consist of;</p>            |
| 05   | Thermal cycle test.        | Low temperature: $-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ , temperature: $+70^{\circ}\text{C} \pm 3^{\circ}\text{C}$ , cycle: 1 hour/cycle each, and then keep 5 cycles in a room. |
| 06   | Vibration                  | 10~200~10Hz sin-wave sweep 15min. 5G(constant) X,Y, Z 3 direction. 2 hours each, total 6 hours.   |
| 07   | Fix drop test              | Fix on jig. Then drop from 152cm height to the concrete floor X, y, z 6 direction. 5 times each, total 30 times.  |
| 08   | Free drop test             | Free drop from 100cm height to the concrete floor X, y, z 6 direction. 1 times each, total 6 times.   |
| 09   | Rated Power test           | Rated Power white noise is applied for 96 hours In 1cc Box  |
| 10   | Max Power test             | Max power 1 min on – 2 min off 10 cycles.   |
| 11   | Terminal strength test     | Capable of withstand 1kg load for 30 seconds without resulting in any damage or rejection.  |
| 12   | Protection against liquids | Protected against 30 minutes of immersion under 1M pressure   |
| <b>Criterion: After these test , the change of S.P.L shall be within <math>\pm 3</math> dB .</b> |                            |   |

#### Soldering Condition

Recommend using constant branding iron in **15 ~ 30W**, and in temperature range  **$350 \pm 10^{\circ}\text{C}$** .

Soldering time not over **3 seconds**.

## 5. Packing

| REV NO.   | REVISION NOTE   | APPROVAL              | DATE             |
|---|---|-----------------------|------------------|
|   |  <p>Cover(290*225*3mm)<br/>Material: Paper</p>   |                       |                  |
|   |  <p>Box(290*225*10mm)<br/>100pcs<br/>Material: Paper+Epe</p>                                  |                       |                  |
|   |  <p>OPP TAPE</p> <p>Middle(290*225*135mm)<br/>1000pcs(10*100pcs)<br/>Material: Paper+Epe</p> |                       |                  |
|   |  <p>Outer Box(515*320*280mm)<br/>4000pcs(4*1000pcs)<br/>Material: Paper</p>                  |                       |                  |
| 单位: mm  |   |                       |                  |
| TITLE: Packing  |   | DRAWN: Lily           | DATE: 2016/08/18 |
| PART NO.  |   | DESIGNED: R&D OF D.S. | SCALE: 2:1       |
| DWG NO.   |   | CHECKED: Emily        | SHEET: 1 of 1    |
|   |   | APPROVAL: Eric        | UNITS: mm        |
|   |   | TOLERANCE             |                  |
| REV   |   | MATERIAL:             |                  |
|   |   | 20~11                 | ± 0.3            |
|   |   | 10~5                  | ± 0.2            |
|   |   | <4                    | ± 0.1            |
| <div style="display: inline-block; border: 1px solid black; padding: 2px 5px;">DS</div> <b>Changzhou Dragon State Electronic Co., Ltd</b> |   |                       |                  |